37

The Nautilus.

Vol. XXXI. OCTOBER, 1917. No. 2

NOTES ON THE VARIATION OF ISCHNOCHITON CONSPICUUS CPR.

BY E. P. CHACE.

To the naturalist the study of variation and environment and their relation to each other is always interesting and to the conchologist who studies his shells in their natural surroundings as well as in the cabinet many things are revealed. It is not, often, however, that variation in form may be so easily traced to qualities of environment as in the following instance.

Ischnochiton conspicuus, Cpr. is common at San Pedro and is usually found on the under side of rocks in sandy tidepools. In this situation they grow quite regularly, showing but slight variation in form. They are active fellows and evidently sensitive to light; for if the rocks to which they are clinging are turned over, they soon glide away, always taking the shortest route to the under side of the rock.

While cleaning a lot of this species taken at San Pedro last fall two specimens were noticed which differed so widely from the others that they might easily have been mistaken for another species. They were much wider and lower-arched than the typical form and the posterior corners of the valves were rounded off, making the lateral areas very narrow.

Hoping to find more specimens of this odd form, a trip to Point Firmen was devoted wholly to the collection of chitons, with interesting results. The usual species were found in the tidepools including numerous specimens of *Ischnochiton conspicuus* of the ordinary form. Ledges of soft rock beyond the

tidepools contained many old pholad holes and in these were found the form for which I was searching. Twenty specimens of various sizes were collected from as many pholad holes. In the larger specimens the foot had become so greatly enlarged to fit the concave bottoms of the holes that it was impossible for them to curl up in the usual manner. Some of these specimens were so badly eroded by the sand and gravel which wash in and out of the holes that the anterior valve was reduced to two thirds of its normal height.

In color pattern, sculpture, and mantle characters these specimens were identical with those from the tidepools, and, as will be seen by referring to the table of measurements, the smaller specimens approach quite closely to the proportions of the typical or tidepool forms.

Typical or Tidepool Forms. (Lot 1)				Specimens From Pholad Holes. (Lot 2)			
Lon.	*Lat.*	*Index.*	*Div.*	*Lon.*	*Lat.*	*Index.*	*Div.*
99	35	2.52	130°	65	33	1.97	135°
83	33	2.51	130°	63	32	1.97	155°
83	30	2.76	125°	62	27	2.29	140°
62	22	2.80	125°	60	30	2.00	130°
59	23	2.56	130°	56	29	1.93	130°
38	14	2.71	130°	42	17	2.47	130°

In brief, Lot 1 shows an angle of divergence constant at 125° to 130°, where Lot 2 shows an angle varying from 130° to 155°, and a proportion of length to width 2.51 to 2.80 as against a proportion ranging from 2.47 to 1.93.

The noticeable differences to the eye are first, the narrow and sharply raised lateral areas, and second, the shape of the posterior edge of the median valves. In the tidepool specimens the posterior or exposed edge of each valve is a straight line, while in specimens from the pholad holes this line becomes a double convex curve, the most posterior portion of the valves being about midway between the beaks and the girdle.

These differences seem to be explained by the following facts. In collecting, the tidepool specimens are usually found on the under side of large rocks and well back from the edge. This situs protects them from the light which they evidently find

objectionable, but it makes necessary a nightly journey of about two feet to the nearest growth of algae on which they feed. This activity stretches the girdle downward from the edges of the valves and permits a free play of all the valves so that the mantle deposits its shelly secretions according to the normal habit of the species. The specimens living in the pholad holes, however, apparently never leave them as they are frequently found feeding on the fucus which overhangs them. It protects them from the light, so they have no occasion to move about, and the sand which is washed down into these burrows would make re-entrance almost impossible. A series of these specimens shows a gradual change of form. The young specimens are very similar to young specimens from the tidepools, but as they increase in size they become crowded so that the valves press against each other, especially at the posterior end where the valves are bent back across the bottom of the hole. This crowding of the valves upon each other and the crowding of the girdle against the outer edges of the valves so displaces portions of the mantle as to cause the changes noted above.

Several specimens from each situs were disjointed and a study of the individual valves showed that those from pholad-hole specimens were thicker and had shorter sutural plates and a wider sinus, this last being especially noticeable in the valves from the posterior end. Apparently this change in the sinus is the result of the broadening of the connecting ligaments due to compression by the crowding valves.

A count of the insertion plates of these disjointed specimens was made and considerable variation noticed. So much, in fact, that more specimens were pulled apart for the express purpose of counting these plates. Representative counts were as follows: 9 slits on the anterior valve, 2–3 on the median valves, and 10 on the posterior. Others show 12, 2–3, 8; 11, 2–3; 14, 3–4, 11. Absolutely no difference in this character could be found between specimens from the tidepools and those from the pholad holes.

On page 64 of vol. xiv of the Manual of Conchology, Dr. Pilsbry says, "Carpenter has given a varietal name to a broad, worn specimen which he thus describes:

"Var. *solidus*. Very solid, wide, ashen; inside whitish, the posterior valve with 10, central valve 2–3, anterior valve 12 slits. Length 72, breadth 40, divergence 130°. Carpenteria, near Sta. Barbara, Cal. This is scarcely more than an individual variation. The mantle (girdle) is normal. The sculpture is worn away except at the edge. It has evidently lived in a very exposed situation."

From this description and the figure which he gives of the valves it would seem that this is the same form as my specimens from the pholad holes. I fully agree with Dr. Pilsbry that it is hardly worthy of varietal rank. It is, however, too distinct in appearance to be labeled simply *Ischnochiton conspicuus*, Cpr., and I have therefore marked these specimens from the pholad holes *I. conspicuus*, Cpr., *form solida*, Cpr., using the term *form* as advocated by Dr. Cockerell, "to designate variations plainly due to environment."[1]

LAMPSILIS VENTRICOSA COHONGORONTA IN THE POTOMAC RIVER.

BY WILLIAM A. MARSHALL.

In 1912 Dr. A. E. Ortmann recorded[2] finding in the Potomac River a variety of *Lampsilis ventricosa*[3] to which he gave the name *cohongoronta*. His records were:

September 4, 1909. Potomac River, Hancock, Washington, Co., Md. (about two dozen).

May 9, 1911. South Branch, Potomac River, Southbranch, Hampshire Co., W. Va. (about a dozen).

August 16, 1911. Shenandoah River, Harper's Ferry, Jefferson Co., W. Va. (a single male, below medium size).

May 6, 1912. South Branch, Potomac River, Romney, Hampshire Co., W. Va. (about a dozen).

Dr. Ortmann remarked "It is probable that this species will

[1] NAUTILUS, vol. xx, pp. 58–60.

[2] NAUTILUS, xxvi, pp. 51–55, 1912.

[3] In a later work Ortmann classifies both *ventricosa* and *cohongoronta* as varieties of *ovata* Say.